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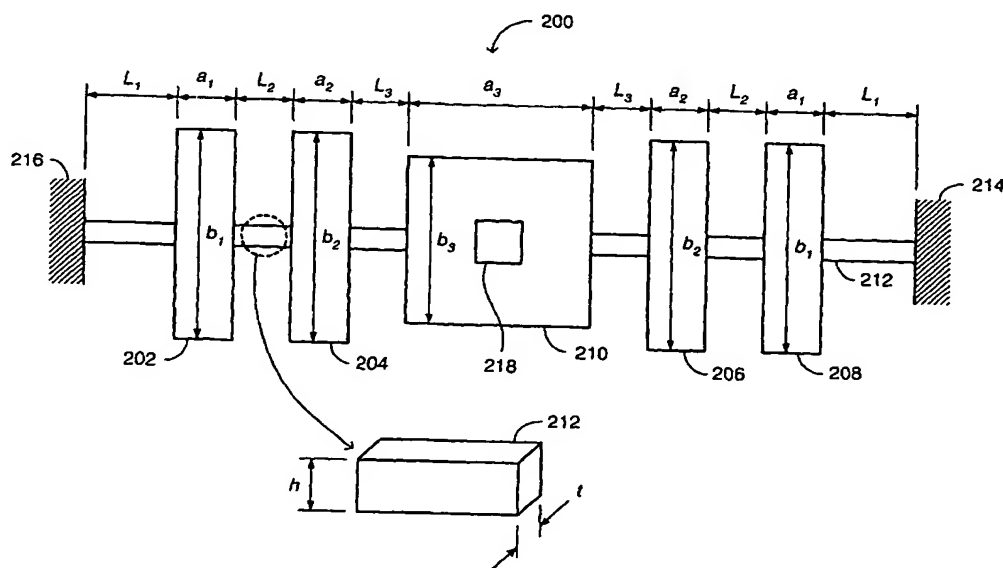
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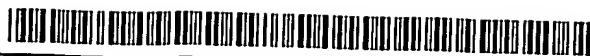
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[Continued on next page]

(54) Title: OSCILLATING MIRROR HAVING A PLURALITY OF EIGENMODES



(57) Abstract: Oscillating mirror system (200) including a plurality of masses (202, 204, 210, 206, 208), at least one force producing element (218), and a plurality of elastic elements (212), each of the force producing elements (218) being coupled with a respective one of the masses, at least one of the masses (210) including a mirror (210), each of the force producing elements (218) applying a force to the masses, the elastic elements (212) coupling the masses (202, 204, 210, 206, 208) together, the elastic elements (212) coupling the masses with a respective support (214, 216), wherein the mass values of the masses, the force values of the forces, and the stiffness coefficients of the elastic elements, are selected such that the mirror periodically according to the eigenfrequencies of the oscillating mirror system (200).



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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 197 28 598 A (BOSCH GMBH ROBERT) 4 February 1999 (1999-02-04) column 3, line 5 - line 20 column 4, line 39 - column 5, line 66; figure 1	1-18
X	DE 101 19 073 A (SCHNEIDER LASER TECHNOLOGIES A) 5 December 2002 (2002-12-05) paragraphs '0050! - '0054! figures 1,2	1-18
X	US 2001/055146 A1 (ATOBE MITSURO ET AL) 27 December 2001 (2001-12-27) paragraphs '0146! - '0148! paragraphs '0154!, '0155! figures 1,2	1-18

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98/44571 A (XROS INC) 8 October 1998 (1998-10-08) page 19, line 5 - line 31 figure 13	1-18
A	----- LUCENTE, M; ST. HILAIRE, P; BENTON, S; ARIAS, D.L.; WATLINGTON, J.A.: "New Approaches to Holographic Video" SPIE PROCEEDINGS OF HOLOGRAPHICS INTERNATIONAL '92, vol. 1732, July 1992 (1992-07), pages 377-386, XP002298455 BELLINGHAM, WA page 384, paragraph 3 - paragraph 5	1-4
A	----- US 4 958 894 A (KHOWLES CARL H) 25 September 1990 (1990-09-25) column 2, line 34 - line 40 figure 4	1-3

INTERNATIONAL SEARCH REPORT

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 19728598	A	04-02-1999	DE 19728598 A1	04-02-1999
DE 10119073	A	05-12-2002	DE 10119073 A1	05-12-2002
			WO 02099504 A2	12-12-2002
			EP 1421429 A2	26-05-2004
			US 2004130765 A1	08-07-2004
US 2001055146	A1	27-12-2001	JP 9159937 A	20-06-1997
			JP 9236762 A	09-09-1997
			US 6271955 B1	07-08-2001
			US 6107115 A	22-08-2000
			US 2003016435 A1	23-01-2003
			US 5999306 A	07-12-1999
WO 9844571	A	08-10-1998	EP 1012890 A1	28-06-2000
			JP 2001519726 T	23-10-2001
			US 5969465 A	19-10-1999
			WO 9844571 A1	08-10-1998
US 4958894	A	25-09-1990	WO 9008363 A1	26-07-1990